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Related Pending Application  
 Related Case Serial No: 09/438,425  
 Related Case Filing Date: 11-12-99

## CLAIMS:

1 - Rotating electromagnetic actuator with limited stroke, comprising at least 2N poles on the stator, N being a whole number, energized by at least one energizer coil and N magnetized parts on the rotor arranged in an air gap of thickness E wherein each magnetized part is juxtaposed with at least one ferromagnetic part with a thickness e between 0 and E, defining one or two air gaps with a total length of E-e.

2 - Rotating electromagnetic actuator as claimed in claim 1, preferably single-phase, wherein the width of one of the magnetized parts Y, measured on its mean diameter is equal to

$$C+S+2E'$$

where C is the width of the angular arc travelled by the rotor on the mean diameter of the magnetized parts, S is the width measured on the mean diameter of the magnetized parts between two adjacent stator poles, E' is between E/2 and E,

with

$$\frac{C + 2E'}{E} > 3$$

and

$$\frac{L}{E} > 0.75, \text{ preferably } 0.8 < \frac{L}{E} < 0.9$$

L designates the thickness of a magnetized part in the direction of magnetization, in order to ensure a torque due to the current roughly constant along the length of the stroke and roughly proportional to the current.

3 - Rotating electromagnetic actuator as claimed in claim 1 wherein the interposed ferromagnetic parts of the mobile part have a thickness e in the direction of magnetization of the magnetized parts of thickness L, so that:  $0 < e/L < 0.6$ .

4 - Rotating electromagnetic actuator as claimed in at least one of the

preceding claims wherein the N magnetized parts are composed of several juxtaposed magnets.

5 - Rotating electromagnetic actuator as claimed in claim 1 wherein the stationary component (2) comprises a stator part with 2N polar parts (8, 9) shaped like a tubular sector, each surrounded by an energizer coil (10, 10').

6 - Rotating electromagnetic actuator as claimed in claim 1 wherein the stationary component (2) comprises a second stator part (32) symmetrical to the first stator part, also with 2N semi-annular polar parts each surrounded by an energizer coil (40, 40').

7 - Rotating electromagnetic actuator as claimed in claim 1 wherein the mobile component (1) is formed by a rotating yoke bearing N magnetized parts (3), magnetized axially, and N interposed ferromagnetic parts (4).

8 - Rotating electromagnetic actuator as claimed in claim 1 wherein the mobile component is tubular or semi-tubular in shape and bears N magnetized parts shaped like tiles, magnetized radially, and at least one interposed ferromagnetic part, and wherein the stationary component has 2N stator poles of semi-tubular shape.

9 - Rotating electromagnetic actuator as claimed in at least one of the preceding claims wherein the mobile component comprises N magnetized parts magnetized after being positioned on the mobile component.

10 - Rotating electromagnetic actuator as claimed in at least one of the preceding claims wherein the mobile component comprises N magnetized parts housed in cavities provided in the yoke (6) of the mobile component, the areas complementary to these cavities forming the interposed ferromagnetic parts.

11 - Rotating electromagnetic actuator as claimed in at least one of the preceding claims wherein the 2N ferromagnetic polar parts of the stator are connected

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between them by saturable ferromagnetic isthmuses.